REMARKS/ARGUMENTS

Reconsideration of this application is requested. Claims 1-10, 12 and 13 are in the case.

I. THE OBVIOUSNESS REJECTION

Claims 1-10, 12 and 13 stand rejected under 35 U.S.C. §103(a) as allegedly unpatentable over Dupire *et al.* (EP 1201711) (Dupire) in view of U.S. Patent Publication No. 2004/0191440 to Funaki *et al.* (Funaki). That rejection is respectfully traversed.

As claimed, the invention provides a pressure pipe resin comprising from 90 to 99.9 wt%, based on the total weight of the resin, of a polyethylene, and from 0.1 to 10 wt%, based on the total weight of the blend, of an ionomer. The invention also provides pressure pipes comprising the pressure pipe resin as claimed.

The claimed invention is concerned with pressure pipes. The specification defines a pressure pipe as "a pipe having a pressure rating of PE 80 and above" (page 1, lines 22-23). The PE 80 rating is explained in the description, and essentially defines any pipe which can withstand a hydrostatic pressure of at least 8MPa for 50 years at 20°C (page 2, lines 1-5). Such high pressure pipes are typically used for transporting gas, and PE 80 is a high level performance standard which is required in the industry.

Based on the above explanation, it will be appreciated that pipes fulfilling the above definition are completely different from, for example, hoses used in automobiles (as discussed below, the secondary reference to Funaki relates fuel hoses for automobiles, which are **not** pressure pipes). The fact that a resin can be made into a

"pipe", such as for use in automobiles, gives no information about whether it would be suitable as a "pressure pipe".

The surprising discovery underlying the present invention is that addition of an ionomer to polyethylene used in pressure pipes gives rise to improvement in the long-term creep performance of the polyethylene, and can therefore result in pressure pipes with improved properties. This discovery is not suggested by the cited references when taken singly or in combination.

Dupire discloses a "pressure pipe" resin having good resistance to slow crack growth and improved long-term creep performance. However, as admitted in the Action, Dupire is silent with regard to the use of an ionomer.

As noted in the description of the present application, the metallocene resins B and C used in the Examples thereof were made as described in WO 02/34829. WO 02/34829 is EP 1201713A, and is a "sister" application of Dupire, with the same inventors. The resins disclosed in the two applications are very similar. Thus, while the Examples in the present application do not show the effect of adding ionomer to the resins of Dupire, they do show the effect of adding ionomer to almost identical resins.

The present Examples show clearly that addition of ionomer results in an improvement in creep resistance, and surprisingly with the largest improvement being present at lower levels of ionomer. This phenomenon is not disclosed or suggested by Dupire and is also not suggested by Dupire and Funaki taken together.

As noted earlier, Funaki relates fuel hoses for automobiles. Thus, the pipes with which Funaki is concerned are **not** pressure pipes. There is no suggestion in Funaki of physical properties such as long-term creep and resistance to slow crack growth which

are important for pressure pipes, only a discussion of low-temperature impact resistance, which is not a significant issue for a pipe which spends its life underground.

One of ordinary skill would not, therefore, have been motivated to combine Funaki with Dupire, because Funaki, being limited to fuel hoses, would not have lead the person of ordinary skill to a reasonable expectation that addition of an ionomer in a pressure pipe would improve the performance of the pressure pipe. In other words, Funaki provides no motivation or information with regard to question of whether or not it would have been obvious to one of ordinary skill to add an ionomer to polyethylene used for fabrication of a pressure pipe.

The fundamental point is that the present invention is concerned with pressure pipes, which is a very specialized application. The important properties for pressure pipes include long term creep resistance, since they have to be able to withstand sustained pressures, often underground, for many years. This long term creep resistance is one of the factors which contributes to the rating of a pressure pipe as "PE80" or "PE100". Other factors are resistance to slow crack growth (ESCR) and resistance to rapid crack propagation. Impact resistance is not considered a significant issue. Without a "PE80" or "PE100" rating, a pipe is not considered suitable for this application. The solid state creep results described in the Examples of the present application are linked to long term creep resistance. It is clear from the Examples that the addition of an ionomer clearly results in an improvement.

Clearly, therefore, one of ordinary skill, looking to improve long term creep resistance, or indeed any other property relevant to pressure pipes, would not have considered Funaki because Funaki is concerned with fuel hoses for automobiles which

are **not** pressure pipes. There is no mention in Funaki of the types of physical properties, such as long-term creep and resistance to slow crack growth, which are important for pressure pipes, only a discussion of low-temperature impact resistance, which is not a significant issue for a pipe which typically spends its life underground.

Furthermore, it is important to note that Funaki does not improve the impact resistance by specifically adding an ionomer. Rather, impact resistance is improved by adding a rubbery polymer (see para [0080]), which itself may contain an ionomer. It is actually the rubbery nature of the added polymer that is improving the impact resistance (by giving the pipe a degree of flexibility to absorb impact), rather than the ionomer *per se*. Funaki, therefore, does not inform or suggest to the skilled person anything about whether or not the addition of ionomers would improve the performance of pressure pipes. In fact, adding a rubbery polymer to a pressure pipe resin is more likely to reduce the long term creep properties than improve them, as it is likely to soften the pipe.

Based on the above, it is clear that one of ordinary skill would not have been motivated to combine Dupire and Funaki. Absent any such motivation, a *prima facie* case of obviousness has not been made out in this case. Reconsideration and withdrawal of the outstanding obviousness rejection are accordingly respectfully requested.

II. CLAIM AMENDMENTS

Minor amendments to the claims are presented to improve their form. No new matter is entered.

BETTONVILLE et al
Appl. No. 10/561,796
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Favorable action is awaited.

Respectfully submitted,

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